

# Land Acquisition and Buyouts as Disaster Mitigation after Hurricane Sandy in the United States

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## Abstract

To what degree are the land acquisition and buyouts proposed for the Hurricane Sandy Disaster area effective mitigation strategies? The 3 jurisdictions considered in the paper—New York State, New York City, New Jersey—are all planning to use some form of buyout as one option for their residents.

This paper considers the mitigation efforts proposed in recovery processes in New York and New Jersey, especially the use of residential property buyouts and land acquisition for future disaster mitigation. The buyouts proposed for these 3 different jurisdiction vary significantly in their underlying motivation, funding sources and implementation systems, and rules for future land use for purchased properties. They include different considerations of how to create a sustainable future for the buyout target areas and the region overall. These include individual mitigation of moving residents out of a hazardous area, the larger scale mitigation impact of creating a natural buffer zone through the land acquired, or conversely a focus on buyouts for a more resilient redevelopment of the same area with elevated construction.

Relocating residents away from hazardous areas is unquestionably a reduction of disaster risk. However, questions arise regarding the balance of relocation and recovery. Relocation in the U.S. does not include any consideration of where the residents will relocate *to*; it is a property sale and ends with payment. What impact does relocation have therefore on the sustainability of community recovery? As the first stage of implementation has not even started for any of the 3 plans, at this point it is impossible to say definitively to what scale they will ultimately be carried out, and to what degree they will increase sustainability in the region. The 3 jurisdictions each have their own political background and historical context related to land and coastal development, which will likely greatly affect the outcome of these buyout plans, which are each taking place in their larger historical, political geographical contexts. All 3 plans are very limited in scale in terms of the target number of disaster survivors who can (and who may want to) participate. The impact of these specific plans on their own will therefore be quite limited, even if they are completely successful in their stated goals for clustered buyouts, and the creation of buffer zones or redeveloped areas, respectively. It will be necessary to wait to see the outcome of implementation before the buyout plans that are proposed for the Sandy disaster area can be evaluated as mitigation strategies. However, these buyouts may have the potential to become model cases of sustainable mitigation strategies for a more resilient city.

*Keywords:* Hurricane Sandy, Land Acquisition, Disaster Mitigation, Regional Sustainability

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## 1. Introduction

Hurricane Sandy hit the eastern coast of the U.S. in October 2012 and caused more than \$71 billion in damages, destroying more than 305,000 houses in New York and more than 346,000 in New Jersey. Figure 1 shows the areas affected by Sandy.

With climate change and predicted sea level rise, recovery must consider how to create a resilient area, as devastating storms will be more likely in the future. There are some precedents in the United States of using buyouts to acquire property from homeowners after a disaster. After the Midwest Floods of 1993 the Stafford Act was amended to allow land acquisition as mitigation, and since then, over 20,000 households have been bought out through FEMA's hazard mitigation buyout program. Through FEMA's Hazard Mitigation Grand Fund, buyouts are already in process for upstate New York, an area outside of the Hurricane Sandy disaster area, but which has struck by Hurricanes Irene and Lee in 2011. This recent (and nearby) example of FEMA funded mitigation buyouts serves as a model for the proposed buyouts. However, HMGF buyouts have focused on relocation outside of river flood planes, and there are no precedents of use in coastal areas. The focus of this paper is the different land acquisition and buyout plans proposed by the State of New York, City of New York, and State of New Jersey. These plans are considered in the context of local coastal development and mitigation planning, and U.S. precedents for flood mitigation, planning and post-disaster compensation. The 3 plans are very different in terms of their stance, goals, and implementation methods, but all include an element of using buyouts towards mitigation.

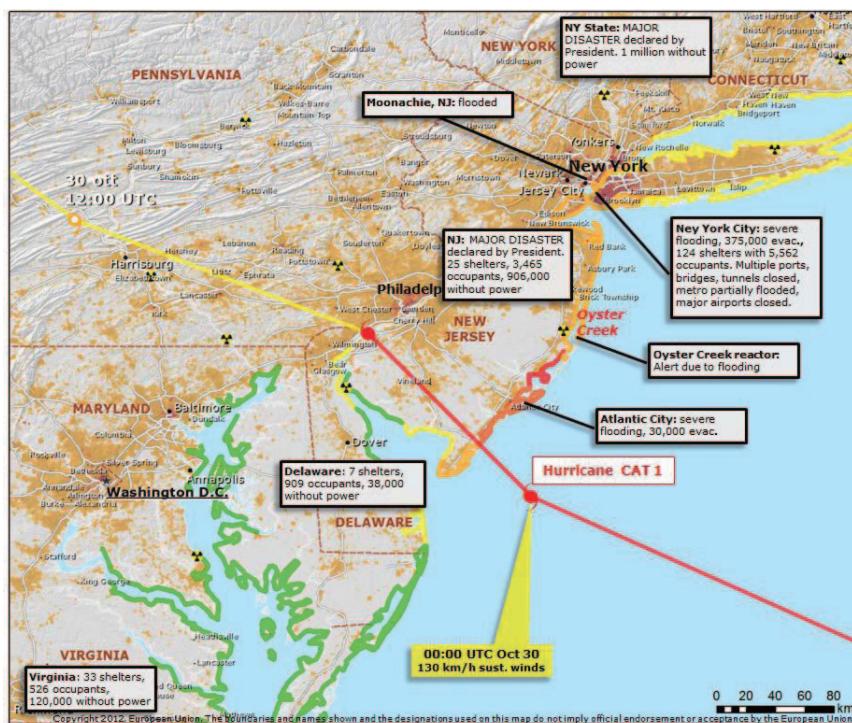


Figure 1. Areas affected by Sandy. Source: European Commission Situation Report, <http://ec.europa.eu/echo/images/photos/news/2012/20121030.jpg>

## 2. 1 Mitigation for Reduction of Disaster Losses

The first priority of disaster risk reduction is to prevent the loss of lives resulting from a natural disaster. During and after Hurricane Sandy, around 100 people lost their lives in the U.S.,

most in New York or New Jersey. To plan for future disasters, there must be improvements in preparedness, evacuation, and response; while some people died from drowning or directly in the storm surge, there were also many secondary deaths after Sandy and in the days following, from causes such as accidents, electrocution, carbon monoxide poisoning, and hypothermia, which were the result of the loss of infrastructure and utility services.

In coastal regions of the United States, recovery and post-disaster planning focus on damage to private property rather than life safety. Based on hurricanes and storm events, this is a significant difference compared with earthquake and tsunami disasters around the world, where the main focus of recovery planning is moving residents out of hazardous areas. Recovery policies as well as mitigation measures focus on restoring the lost value of property, and included complex relationships with insurance and other funding sources. The driving principle behind disaster mitigation measures in the United States is reducing financial losses for individuals and government; in the system where the government pays for disaster damage through disaster assistance for individuals and households, and federally subsidized disaster insurance, and municipal infrastructure repairs, one main objective is to avoid paying for repetitive losses—i.e. disaster losses again and again in the same area.

## **2.2 The National Flood Insurance Program**

In the United States, a basic principle of disaster assistance for residents is that government support comes after private insurance payments, and that homeowners are responsible for being adequately insured. In other words, disaster survivors are only eligible for government support beyond what was insured. In practice, this means that after a disaster, residents often struggle with private insurance companies who do not pay promptly, and/or contend that the damage was caused by something not covered by the policy. For example after Hurricane Katrina, many insurance companies rejected damage claims arguing damage was not due to wind (covered) but due to flooding (not covered). Private insurance does not usually cover flooding. In response to this situation, in 1968 the United States government created the National Flood Insurance Program (NFIP), which makes flood insurance available to private homeowners, renters, and business owners whose community participates in the NFIP (most do). Along with participation in the NFIP, communities agree to adopt and enforce ordinances required by FEMA to reduce flood risk, most significantly to follow the building regulations required by FEMA Flood Insurance Rate Maps (FIRMs).

## **2.3 With the NFIP, Mitigation by Flood Maps**

Flood maps created by FEMA, based on a ‘100-year flood’ event, go hand in hand with the NFIP. This 100 year flood calculation means that there is a predicted 1% chance in any year of experiencing such a flood. As their name states, these Flood Insurance Rate Maps (FIRMs) are the basis for insurance rates. FEMA creates maps for each area at risk of flood-related disaster, specifying the flood zone, which in turn requires elevation of the ground floor to a certain height, and also certain types of foundations, such as pilings or breakaway walls in areas with coastal waves calculated over 3 feet. In order to get a bank mortgage (to buy house), residents must comply with the FEMA flood maps. In the high hazard flood zones, it is mandatory to carry NFIP insurance. In the time of disaster, if household was required by zone to have insurance and did not, they are ineligible to receive benefits for lost property value. On the other hand, when a disaster affects area where NFIP insurance was not required, residents are not blamed for being

uninsured, and can receive full benefits from the government in disaster assistance.

#### 2.4 Zones included in Flood Maps

Flood zones can basically be divided into 3 categories. Moderate/Low risk areas are considered to be at less risk of flooding, or areas protected by a levee or other protection. Moderate/low risk areas fall into categories B, X, or C. This lower risk category is not predicted to flood in a 100 year flood event, but will flood in a more rare extreme flood event, up to a 500-year flood. In Moderate/Low Risk Areas that participate in the NFIP program, NFIP insurance is available to all homeowners and renters, but not required.

The next 2 categories are usually considered as ‘flood zones’ because they include areas predicted to flood in a 100-year event. These 2 high risk flood zones on FEMA’s maps are designated Zone A (High Risk Areas) and Zone V (High Risk Coastal Areas). For communities in these 2 high risk zones that participate in the NFIP, residents are required to have NFIP insurance. Within Zone A, subcategories such as AE include the base flood elevations, which specify how many feet above the ground a building must be elevated. Zone V is used for coastal areas with a 1% or greater chance of flooding (flooding in a 100-year flood) and an additional hazard associated with storm waves. More precisely, this additional hazard in Zone V is storm waves of more than 3 feet above the flood level caused by a 100-year flood. The additional hazard of storm waves leads to more severe elevation and building requirements beyond those of Zone A. However, buildings in coastal areas Zone A are also at risk of storm waves, predicted to be less than 3 feet. Figure 2 shows a section diagram of these 3 levels of zones.

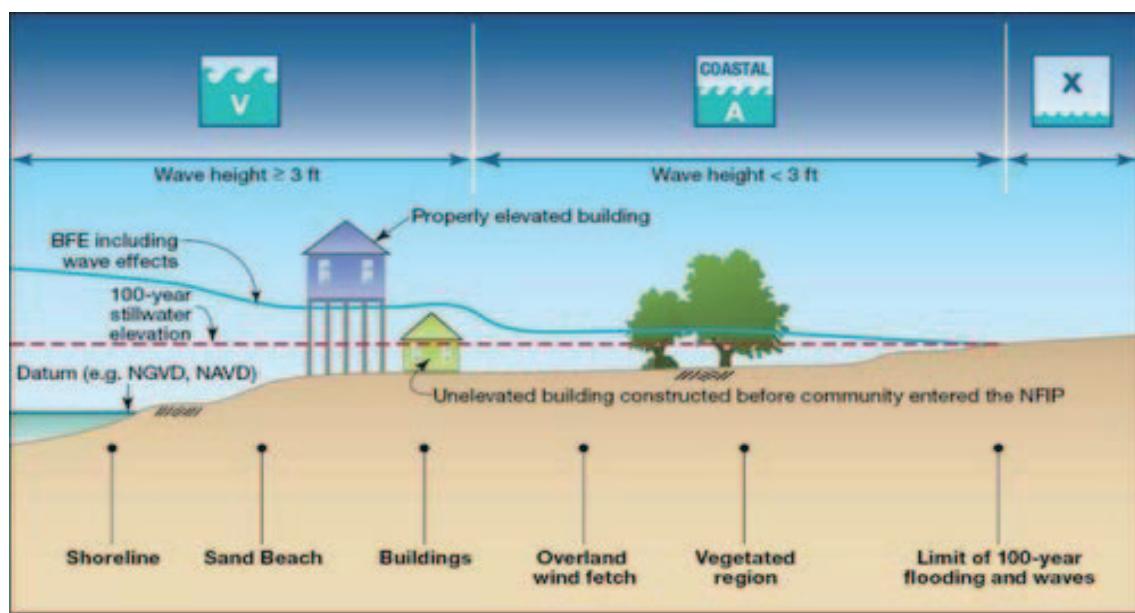


Figure 2. FEMA Diagram showing the different Zones. Source: FEMA website, <http://www.region2coastal.com/coastal-mapping-basics>

#### 2.5 Base Flood Elevation Requirements in Zones A and V

For buildings in the coastal areas in these flood zones, there are different calculations to comply with requirements for A and V zone respectively, but they are both based on Base Flood Elevation (BFE). The elevation requirements for the NFIP are: for Zone A, the top of the lowest

floor must be at or higher than BFE; and in Zone V, the bottom of the lowest horizontal structural member must be at or above BFE. In addition to the BFE elevation requirement, it is recommended to elevated houses an additional 1 foot above the BFE required by the NFIP. This additional height above BFE is referred to as Freeboard as shown in Figure 3, recommended elevations beyond BFE, which is required.

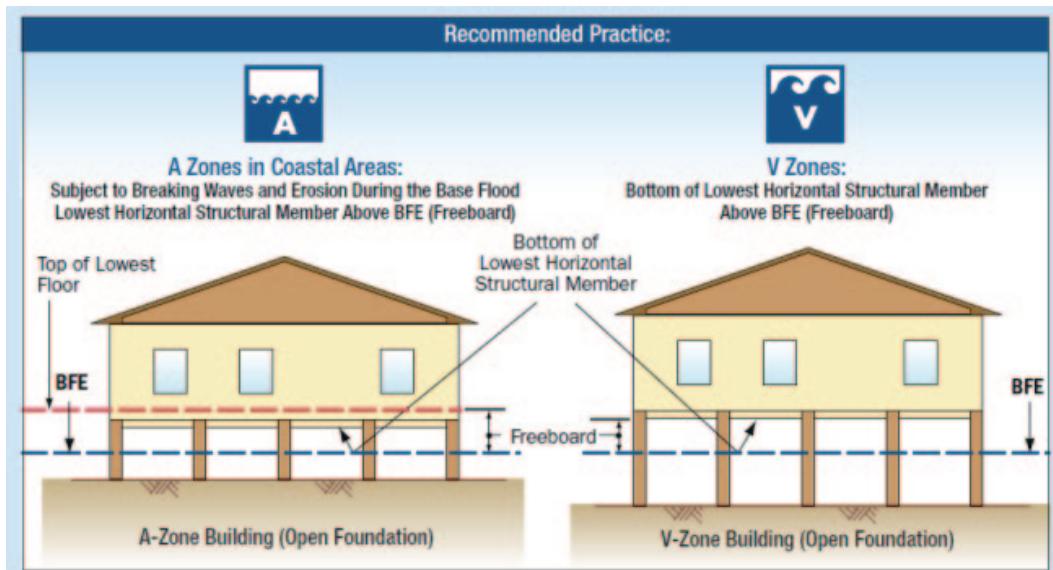


Figure 3. Recommended Building Elevations for Coastal Zone A and Zone V

Source: FEMA. Home Builder's Guide to Coastal Construction: Technical Fact Sheet no. 1.4

### 3.1 Flood Maps in Use Before Sandy

The main adjustment after Hurricane Sandy affecting residential building regulations was/is the revision of FEMA's flood maps, which specify elevation and construction requirements based on predicted flood zones. 2/3 of houses damaged by Hurricane Sandy were outside of the designated flood, and not shown on the FIRM maps.<sup>1)</sup> Before Hurricane Sandy, the FEMA flood maps in New York and New Jersey were based on data from the 1980s, (figure 4) and in New York and New Jersey they were already in the process of revision when Sandy hit.

However, as shown in Figure 5, based on the flooding prediction from the Army Corp of Engineers, the area that actually flooded was very close to predictions for a Category 1 (weakest level). However, Sandy was downgraded from a Category 1 Hurricane (to a non-Hurricane level of Superstorm) before it hit land, so the impact of an actual or stronger hurricane would be worse.

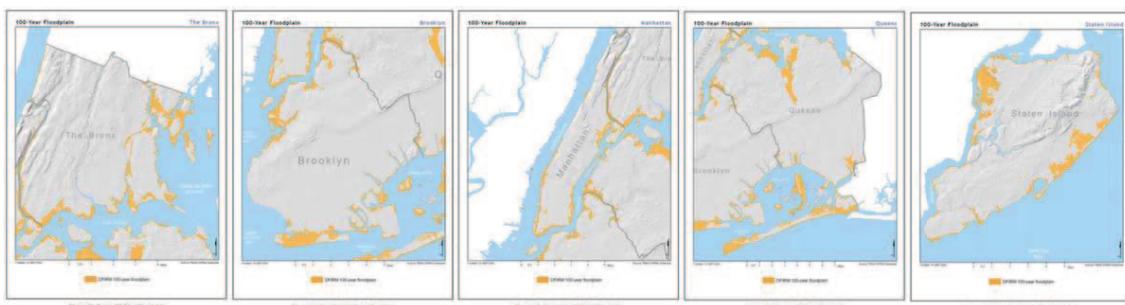


Figure 4. Pre-Sandy flood maps showing the predicted surge from a 100 year flood. Staten Island is the far right image. Source: *The Atlantic*.<sup>2)</sup>

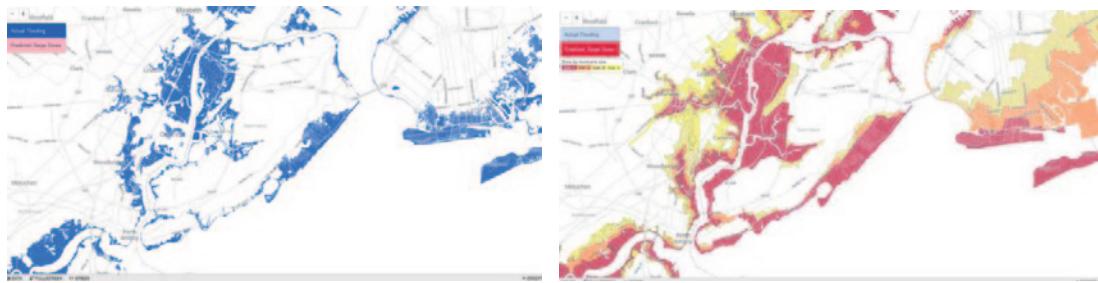


Figure 5. Comparison of predicted storm surge (left) based on Army Corps of Engineers calculations, and actual flooding experienced in NYC. Source: WNYC. <http://project.wnyc.org/flooding-sandy-new/index.html#>

### 3.2 Process of Flood Map Revisions after Sandy

As of June 2013, there have been 2 phases of flood map revisions after Sandy. In the first phase, FEMA released ‘Advisory Base Flood Elevation (ABFE) Maps’ in January and February 2013, as shown in Figure 6, Figure 7 (left) and Figure 8 (left), As their name suggests, ABFE maps are advisory, and suggest elevation heights for specific zones. ABFE maps are often created after a large disaster to determine whether the 1% annual chance flood event, shown on the effective FIRMs, adequately reflects the actual current flood hazard.<sup>3</sup> FEMA also released ABFE maps after Hurricane Katrina. The idea behind ABFE maps is to give advice for residents who want to start the recovery process. The ‘advisory’ nature of the maps is due to the fact that residents are *not required to comply* with them by the NFIP. However, construction following the increased guidelines of the ABFE maps can lead to lower insurance rates, and it can be predicted that these elevations from the ABFE maps will eventually be reflected in future FIRMs.

#### Preliminary Flood Zones

Maps released on Monday by the Federal Emergency Management Agency put more of New York City's south shore into flood zones. [Related Article »](#)

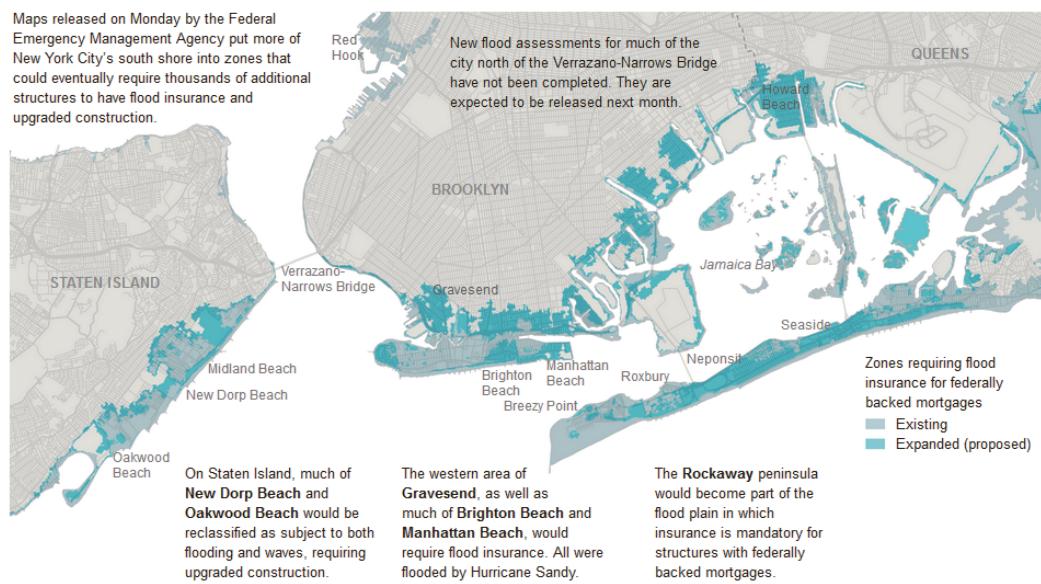


Figure 6. Proposed advisory flood zones for New York City released by FEMA on January 28, 2013, showing the expansion of areas that would newly require flood insurance, or higher elevations.

Source: New York Times.

<http://www.nytimes.com/interactive/2013/01/29/nyregion/preliminary-flood-zones.html?ref=nyregion>

When the ABFE maps were released for New York and New Jersey in early 2013, these guidelines included a significant increase in areas included in flood zones (A and V Zones), which would require residents to purchase NFIP insurance, and also a large increase specifically of areas included in the V zone, which requires higher elevations and specific foundations, such as pile foundations that waves can pass through. The revised maps nearly doubled the number of buildings in flood zones, adding 35,000 more houses and businesses.<sup>4)</sup> Much of coastal New Jersey was designated as V zone along with generally expanded flood zones (A and V zones). With fear of recurring storm events, complying with the new and increased building and insurance regulations made facing the prospect of reconstruction more difficult and expensive for homeowners.

However, in the 2<sup>nd</sup> phase of map revisions, FEMA started releasing “Preliminary Work Maps” in June 2013, Figure 7, right, and Figure 8, right, which are an “interim product created by FEMA in the development of preliminary Flood Insurance Rate Maps (FIRMs)”<sup>5)</sup> and replace the ABFE maps as the “best available map.”



Figure 7. Examples of ABFE maps released in January and February of 2013 for New York (left), and Preliminary Work Map released June 2013 (right), showing the increase and then decrease in High Hazard (V zone) areas, shown in black. Source; WNYC.

<http://www.wnyc.org/articles/wnyc-news/2013/jun/10/fema-backs-advisory-flood-maps/>

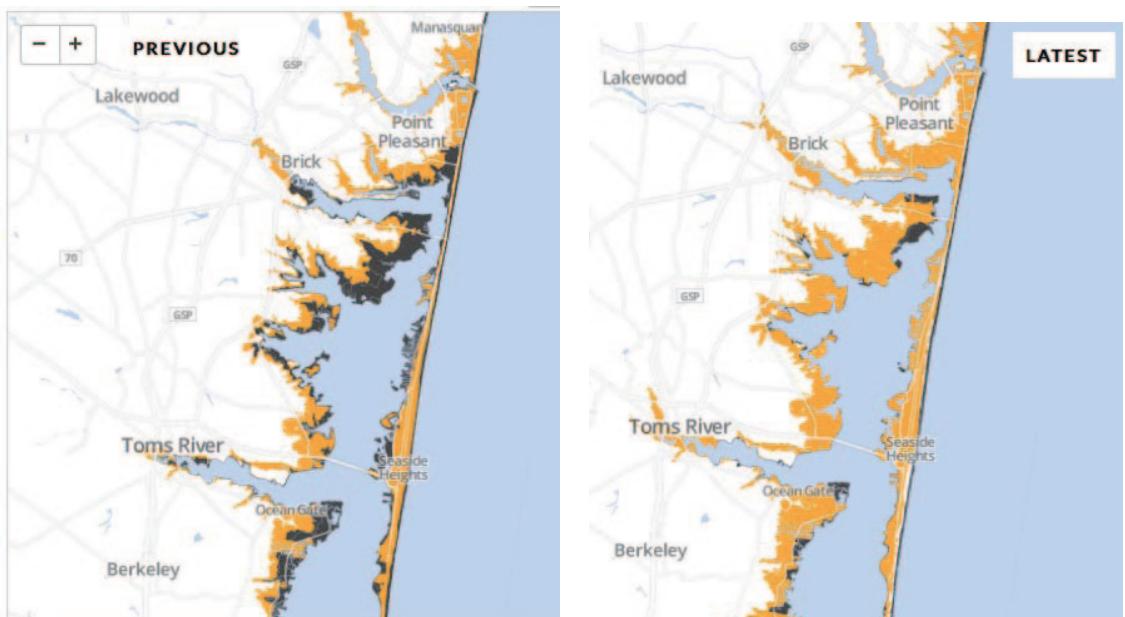


Figure 8: Comparison of FEMA’s AFBE map and Preliminary Work Map for an area of coastal New Jersey, showing the reduction in V zone (black) area after the maps were revised a second time. Source: WNYC

Compared to the pre-Sandy FEMA maps, the flood zone is still larger, but compared to the earlier “advisory maps” the area and number of structures included in the V zone, was much smaller, especially in coastal New Jersey, the hazard level of most areas was reduced from V zone to the less hazardous A zone.

The ABFE maps met strong opposition from local residents and government representatives, who argued that the increased regulations and according additional coast would prevent people from being able to rebuild after Sandy, created a ripple effect as these people would have no option but to move away, thus eroding the local tax base. Citizen opposition was vocal leading to social media campaigns such as the “Stop FEMA Now Movement,” fueled by the fear that middle class residents would have no choice by to leave the area rather than comply with the new requirements and expenses entailed.<sup>6)</sup> The release of revised, more lenient maps was met with relief from residents and headlines such as “FEMA Flood Elevation Maps Release Helps Property Owners.”<sup>7)</sup> FEMA stated that the maps were not altered as a result of political pressure, and that the first advisory maps were based on a worse case scenario, and were always intended to be adjusted. Yet, this statement has been questioned, along with the perceived leniency of the newest maps, which raises serious questions if FEMA is creating regulations that are strong enough to protect against another Sandy, or a bigger storms that will be more likely with future climate change predictions.

#### **4.1. Policies that work against Disaster Mitigation and Support Poor Coastal Development Practices**

Along with the focus on private property, the US government spends a great deal of money, repeatedly, on coastal areas after disaster. After a disaster declaration, there is a legal framework that supports a number of ways that government funds subsidize coastal rebuilding, without requiring mitigation. Theodoric Meyer outlines the main 4 ways this happens in his article in *ProPublica* entitled “Four Ways the Government Subsidizes Risky Coastal Rebuilding.”

The first is the 1988 Stafford Act, which provides the overall legal framework for disaster response and recovery, including 75% of the budget for infrastructure reconstruction. However, the Stafford Act does not require mitigation or improvement that takes into account increased hazard levels, and usually roads, bridges, etc. are rebuilt the same way they were before the disaster.<sup>8)</sup> In a coastal area that suffers from repeated disasters, the repeated rebuilding is expensive and not sustainable. One extreme example Meyer shares is the story of Dauphin Island, a barrier island off the coast of Alabama discussed in more detail in a 2012 *New York Times* article entitled “As Coasts Rebuild and U.S. Pays, Repeatedly, the Critics Ask Why.” Vacation home development on Dauphin Island started in the 1950s, currently the island has a year-round population of 1,300. Since 1979, Dauphin Island has been struck by around 10 hurricanes and large storms, and has received \$80 million in disaster assistance to repair public infrastructure again and again.<sup>9)</sup> In addition, the national government-funded NFIP has paid \$72.2 million in payments since 1988, although Dauphin Island property owners have paid only \$9.3 million in premiums.<sup>10)</sup>

Created in 1968, subsidies for NFIP from the national government allow individuals to pay insurance premiums that are far below market rates, on average only half of the market rate.<sup>11)</sup> With more disasters causing repeated and larger payouts, and low premiums, the NFIP program went into \$18 billion debt after Hurricane Katrina in 2005; Congress has authorized the NFIP to borrow an additional \$9.7 billion to pay Sandy claims, but the program has no way to pay off its

debt.<sup>12)</sup> However, the Biggert-Waters Flood Insurance Reform Act of 2012 introduced some reforms to the NFIP program, including a gradual increase in premiums for individual households towards eventually reaching market rate.

The government also spends large amounts of money on beach nourishment, which adds sand to beaches that have washed away. Meyer's article, beach's the erode only need nourishment because there is development too close to the ocean—in areas without development, the beaches do not vanish, they just move back with the shoreline.<sup>13)</sup> In addition, beach nourishment can result in encouraging development in vulnerable areas. The Army Corps of Engineers spends an estimated \$125-150 million a year on beach nourishment, and FEMA spends an additional \$25-35 million per year; of the \$50.7 billion Sandy relief bill, includes an estimate \$3.5 billion for putting sand back on beaches.<sup>14)</sup>

Finally, for investors who own beach front property and rent it out, they can take a significant casualty loss deduction on their taxes. If they don't get insurance payment to cover the losses, they can still benefit from a tax write-off.<sup>15)</sup>

#### **4.2 FEMA's Hazard Mitigation Grant Fund (HMGF)**

After the 1993 flooding in the Midwest, the Stafford Act was amended to include the acquisition of flood-prone land, and since then, has been used to purchase the land from 20,000 households.<sup>16)</sup> FEMA, the Federal Emergency Management Agency, administers the Hazard Mitigation Grant Fund, (HMGF) which funds a variety of mitigation activities, including residential property buyouts after disaster to mitigate future disaster losses especially in floodplain areas. HMGF is the largest and most well-known government-funded buyout program for disaster mitigation, providing 75% of national funding for buyout activities. As all mitigation buyouts in the U.S., HMGF buyouts rely on residents voluntarily agreeing to sell, but also require 100% participation in the designated areas. HMGF requires that after the buyout, the acquired land must remain vacant, and uses are limited to parks, etc., that will create a natural buffer zone. Redevelopment as residential or commercial use as well as construction of buildings of any size is forbidden. Not all of the current buyout plans under discussion for New York and New Jersey use HMGF, however to varying degrees, they use similar principles and processes, and the program in New Jersey has received HMGF funding. There is a current HMGF buyout project ongoing in New York State for households who suffered damage after 2011 Hurricanes Lee and Irene.

The three jurisdictions with the most severe damage from Hurricane Sandy--New York State, New Jersey State, and New York City--each have suggested some type of buyouts/property acquisition. National recovery funding has been committed in CDBG-DR (Community Development Block Grants-Disaster Recovery) from HUD (the Department of Housing and Urban Development), and the 3 areas (NY State, NJ State, NY City) have prepared Action Plans for allocation for their portion of the CDBG-DR funds, some buyouts are included to be done with this CDBG funding, although New Jersey's recovery Action Plan does not include buyouts, which will be carried out by a separate pre-existing program.

#### **5.1 The Buyout Plans-New York State**

Under Governor Cuomo, of the 3 programs, New York State's program most closely resembles the HMGF-style of property acquisition; it forbids redevelopment of the property after acquisition in order to avoid repeated damage in the future. Properties acquired through

these buyouts must remain vacant, or can be converted into parks, or natural buffer zones. Along with other housing recovery projects, New York State plans to use CDBG-DR recovery funding for homeowner buyouts for about 1,000 homes estimated at \$400,000 each (total \$4 mil.) in the ‘Recreate NY Buyout Program.’<sup>17)</sup> This buyout program will pay owners the pre-storm value of their property, plus additional incentives for residents in a high-risk area (10%), for group buyouts (10%), and who staying in the same County after relocation (5%). Of the 10,000 houses damaged in the region, in February it was predicted that only 10-15 of them will participate in the buyout program, which increases the chances of a checkerboard pattern of empty lots after the buyouts.<sup>18)</sup> This percentage has not changed much in the following months, with the initial amount available for the first buyouts set at \$171 million. With benefits capped at \$729,750 per homes, program directors still expect about 1000 residents to participate in the program.<sup>19)</sup>

## 5.2 The Buyout Plan -New Jersey State

New Jersey has very lax regulations regarding coastal preservation and or controlling development in coastal areas; in fact owners have the right to rebuild in the same place as any pre-existing structure. With this historic and political context, Governor Christie is emphasizing rebuilding and preserving the tax base over buyouts or creating coastal buffer zones. Buyouts are not included in New Jersey’s first Action Plan for CDBG-DR funds, instead, a payment of \$10,000 is promised to anyone who promises to stay (for at least 2 years) and rebuild, potentially 20,000 households.<sup>20)</sup>

On the other hand, New Jersey is proposing a buyout option using an existing New Jersey land conservation program called Blue Acres, administered by the State Department of Environmental Preservation, which using buyouts to convert individual properties in coastal areas to vacant land where construction is prohibited. Blue Acres was established in 1995, more than 198 properties have been purchased through this program, for \$28.7 million, most in the Raritan and Passaic River Basins, which are areas with more than \$200 million of repeated flood losses.<sup>21)</sup>

Although the ultimate goal of the Blue Acres program is to preserve large areas of coastal land (similar its parent program, Green Acres, which preserves parkland), this is the long term vision, and in the short term, it’s goal is to convert as much coastal land as possible to a undeveloped state. This is a different goal that disaster mitigation only, but the shared outcome has a mitigation as well as preservation benefit. New Jersey has requested an additional \$250 million in Blue Acres funding to buy 10,000 houses damaged by Hurricane Sandy, for about \$250,000 each.<sup>22)</sup>

According to the Governor’s website, the buyout program is a joint effort of the DEP, State Office of Emergency Management (OEM) and the Federal Emergency Management Agency (FEMA); DEP administers all Blue Acres purchases and OEM handles the financing through FEMA.<sup>23)</sup> There are also recent examples in New Jersey, such as the town of Little Falls, of the use of FEMA mitigation funding for house elevations for residents whose houses suffered damage after Hurricane Irene in 2010. This FEMA funding comes from the 2009 Repetitive Flood Claims Program, which pays for the entire cost, and also FEMAs 2010 Severe Repetitive Loss Program, which pays 90% of the cost; funding for buyouts in Little Falls has been provided by HUD through CDBG funding.<sup>24)</sup> This elevation and buyouts are only starting now, 3 years after Hurricane Irene.

### 5.3 The Buyout Plan -New York City

New York City (NYC) which is as large and more economically powerful than the State and has its own Action Plan, also supports buyouts and land acquisition in 2 unique ways.<sup>25)</sup> In June 2013, New York City announced the NYC Build it Back program, which offers 4 choices to homeowners, according the program website: Repair, Rebuild, Reimbursement and Acquisition.<sup>26)</sup> The acquisition program includes 2 tracks for NYC residents—to join the NY State program (explained above), which after the sale will preserve the land as open space, or another option to sell their property to the city of NY, who plans that the land will be redeveloped in a more disaster-resilient way. There are few details available regarding the acquisition and redevelopment program, but it is based on the Road Home Program used in New Orleans after Hurricane Katrina, and the Louisiana Land Trust that was set up to manage the properties acquired from disaster survivors, and their development.<sup>27)</sup>

### 5.4 Comparisons of Buyout Plans

These three plans show that NY State, NYC, and NJ State have different motivation and goals for resilience and recovery, especially towards buyouts and land acquisition, as shown in Table 1. NYC's plan focuses on viable sustainable neighborhoods post- disasters, whereas the buyouts in NY State and NJ focus on creating barrier zones where development will be forbidden.

**Table 1. Comparison of the Buyout Plans for the 3 Jurisdictions**

	New York State	New Jersey	New York City
<b>Stance regarding buyouts included in Action Plan (recovery Plan for CDBG-DR funds)</b>	Strong endorsement of buyouts to remove residents from hazardous areas, and also to create natural buffer zones.	Buyouts not included in the Action Plan, which instead offers a bonus of \$10,000 for 20,000 households who commit to remain for at least 2 years.	Supporting buyouts for redevelopment towards the creation of resilient communities. Residents can also join NY State buyout program.
<b>Who administers the buyout program?</b>	New York State	The pre-existing Blue Acres program, (State Department of Environmental Conservation).	New York City
<b>Buyout Program Name</b>	Recreate NY-Home Buyout Program	“Willing Seller” plan through Blue Acres	NYC Build it Back program
<b>Objective of the Buyout Program</b>	Supporting buyouts toward the creation of natural buffer zones,	Transfer land to natural zone, control again future development.	Create a more resilient neighborhoods in the future, allow individual residents to move out and receive compensation.
<b>Modeled on any preexisting</b>	FEMAs HMGF acquisition model	Blue Acres coastal preservation program.	Road Home and Louisiana Land Trust used in New

<b>program?</b>			Orleans after Hurricane Katrina
<b>Outcome for the land</b>	House razed, converted to park/buffer	House razed, converted to park/buffer	Property can be transferred and will be redeveloped.
<b>Value Paid</b>	Pre-storm, plus incentives up to +25% for enhanced area, group buyout, staying in the County	Pre-storm	Post-storm (allows areas outside enhanced area target)
<b>Total target number of households</b>	1000	1000	unknown
<b>Total Funding</b>	Planned: \$400 million from first round,	Planned \$300 Million	unknown
<b>Source of Funding</b>	CDBG-RD from Community Development Block Grants HUD;	Blue Acres program of NY DEP, funding is from FEMAs Hazard Mitigation Grant Fund.	CDBG RD from HUD, part of recovery funding;
<b>First phase</b>	\$171 Million in first round	\$29 Million	unknown
<b>First target area, case</b>	Fox Beach, Staten Island	Sayreville, South River, in Middlesex County; Delaware Bay homes in Lawrence Township in Cumberland County.	unknown

During the authors' field visit to the disaster areas in coastal New York and New Jersey in February and March, 2013, some stark differences in land use and disaster damage could be seen, which relate to these different plans.

### 5.6 The Case of NY State Governor's Plan, Staten Island-

In the Fox Beach, in Oakwood Beach, neighborhood of Staten Island, NY (Figure 9), residents are organizing for a group buyout, and will likely become the first model for NY State's Buyout Program. Staten Island had significant damage from Sandy, and in the Fox Beach neighborhood, several people died during the storm surge, by drowning in their houses. This neighborhood has seen repeated flooding in the past, and has had levees that have also been destroyed by previous floods. Including Fox Beach, there are at least 5 communities in Staten Island that are in the process of organizing for a buyout; Great Kills, Midland Beach, Cedar Grove Beach, and Tottenville.<sup>28)</sup> More than 150 of the 185 residents in Fox Beach have signed on for the buyouts.



Figure 9. Oakwood Beach, State Island, New York  
Map: *New York Times*; Photo: author

### 5.7 The Case of New Jersey

Along the coast of New Jersey, on the other hand, there is extensive residential development on barrier islands on which the State of New Jersey has refused to limit development, choosing development over ecological resilience. Instead, residents have been granted the right to rebuild anywhere there is already a structure. One example of this kind of development is in Mantoloking, New Jersey (Figure 10), which is also an example of the more wealthy community with many summer (second) homes, which is the case for many, but not all, of the disaster areas in New Jersey.



Figure 10. Mantoloking, New Jersey  
Map source: *New York Times*; Photo: author

As mentioned earlier, the FEMAs HGMF has never been used for buyouts in coastal zones, and neither has the Blue Acres program in New Jersey. Because of the values of coastal property, it is very difficult to encourage homeowners to accept a buyout, and because building regulations permit construction on barrier islands and very close to the shore, there is not much regulatory incentive to stop these kind of development pattern. The most recent flood maps released by FEMA, in their scaled back from, also do not change more in terms of requiring higher standards for construction in coastal areas. Whereas the implementation of buyouts and land acquisition is planned and about to start in New Jersey, the first project is focusing on a

non-coastal area, and implementation of buyouts will likely continue to follow that trend.

There are eight towns in Middlesex County who are participating in the buyout program in New Jersey, through the Blue Acres program. These towns are: Old Bridge, Sayreville, Woodbridge, Carteret, South River, South Amboy, East Brunswick and Middlesex Borough. Those towns either are on Raritan Bay, or the Raritan or South Rivers, all of which flooded during the hurricane. Everyone who suffered damage from Sandy was sent an application for the program, and residents were also encouraged to apply also if their house is in the hazardous area according to new flood maps.<sup>29)</sup> In July, the first buyouts are planned to start, with 300 homeowners in Sayreville and South River.<sup>30)</sup> In Sayreville, there were 270 homes damaged by Sandy. Governor Christie has announced plans to use \$300 million for buyouts for approximately 1000 households.<sup>31)</sup> In June 2013, \$29 million was transferred to the Department of Environment Protection (the agency that administers Green Acres) to buy out the first group of 129 residents in Sayreville who are planning to participate; they are clustered in 2 neighborhoods, and it is predicted that more buyouts will occur in Sayreville subsequently.<sup>32)</sup> This funding is from FEMA's Hazard Mitigation Grant Fund.

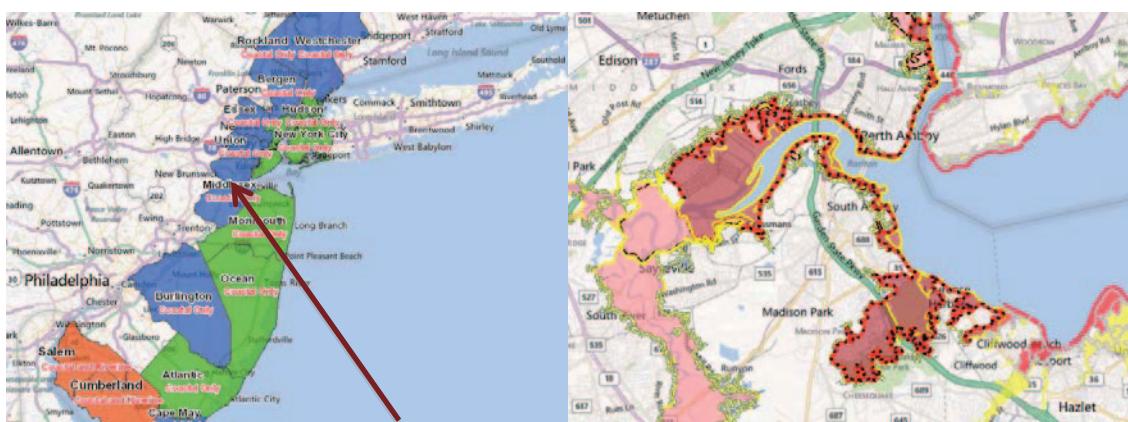


Figure 11. Location of Sayreville, New Jersey (left) and new flood maps for Sayreville (right). Flood zones are zone V, with 17 feet elevation required, and Zone A, with 15 feet elevation required to meet the 100-year flood. Source: FEMA website.

## 6.1 Potential Community impact of Buyouts

All buyout policies in the United States are focused on providing government compensation for property that is in a hazardous area, often after the area has experienced damage from a natural disaster. They are not at all concerned with measures to keep the pre-buyout community together, or preparing any support for relocation or reconstruction after the buyout. In the U.S., buyouts are a simple transaction, and end after the sale and the homeowner receives cash for the properties. After the buyout, each resident is on their own.

This means that each resident may have more individual freedom to choose where and how to rebuild, but prior community networks and neighborhood will disappear after any buyout program of a significant scale.

An added factor is that community organization and collective organizing will have a significant effect on the selection of a community for a buyout zone, as is the case in Fox Beach part of Staten Island. Although the proposed buyout programs do not require that the target community initiates the project by gathering residents who agree to sell, in fact the limited

funding for these programs as well as the desire to relocate entire communities means that the respective agencies implementing the projects will prioritize areas where residents are unified and actively pursuing a buyout option as a group.

## **6.2 Buyout Issues-Checkerboards and Jack-o-lanterns**

The residential buyout programs proposed for use in both New York State and New Jersey State have the long term aim of creating open space, both to create a buffer zone/or coastal protection zone, and also to relocate entire communities away from hazardous areas. Whereas these programs offer incentives to encourage entire communities to participate, they are ultimately voluntary programs, and there is the potential to have a checkerboard pattern of pre-existing housing and empty lots for some time. This raises critical issues for the outcome of the community members who are left behind and what these neighborhoods will become in the interim.

## **6.3 Analysis—Evaluate the Buyout Plans in Terms of Mitigation**

At the most simple level, the best mitigation project will improve the safety of residents; the clearest way to do this is by moving them away from a hazardous area. More than 100 people died during or after Hurricane Sandy on the East Coast of the United States. Many of them were elderly. Of these, there were 43 deaths in New York City, mostly in Queens and Staten Island, primarily due to drowning in the storm surge.<sup>33)</sup> 37 people died in New Jersey.<sup>34)</sup> Of the people who died, many were not killed by the flooding or the storm itself, but died because of fall, accidents, electrocution, carbon monoxide poisoning, or hypothermia in the days following. There were casualties both in coastal areas, but also inland, especially those related to accidents. Based on these facts, residential relocation for mitigation is only a small part of reducing the number of lives lost to natural disaster, and other aspects especially evacuation play a larger role. The acquisition of residential property through government buyouts, whereas it may save lives in the long run by relocation of residents, is primarily focused on preventing future property loss, which benefits both the individual, and also reduces costs paid by the government after disaster.

The 3 programs discussed in this paper take various approaches to using buyouts for land use planning for mitigation. Although they have not yet been implemented and therefore the outcome is still unknown, the degree to which they embody mitigation efforts varies. On one hand, the individual residents who are able to relocate to a less hazardous area have benefited personally from mitigation of their own situation. Whether large areas can be converted to buffer zones through buyout programs, both to prevent anyone living in these hazardous areas, and also to reduce the effect of future flood events, is yet to be seen.

In addition, and significantly, the buyout program represent a very small portion of recovery projects, both in terms of the number of residents who can/will/want to participate in them, and accordingly the size of the area that will be impacted by them. For the buyout and redevelopment program planned for New York City, there is the goal to create neighborhoods that are safer against disasters, but through redevelopment and elevation, not relocation. Therefore, residents are still remaining in the area.

In general, it seems like residential acquisitions/buyouts may benefit the residents, and offer them additional choices, which may help them recover. However, as a holistic and overall management strategy for disaster mitigation, is unlikely to play a large role, especially

compared to other zoning policies that permit coastal development with little control. The different recovery strategies used in different areas after Hurricane Sandy will likely lead to different levels in resilient communities, and relocation efforts will be one marker of sustainable outcomes.

#### 6.4 Climate Change and Sea Level Rise

Finally, this entire discussion is taking place within the shadow of climate change and predicted sea level rise and an increase of storm events. Recent studies have shown that large storms the size of Sandy are likely to occur regularly in the future, and as sea level rises, the impact of these storms will only be more intense and powerful. In light of this future direction, the land use planning that is part of recovery after Sandy seems not to take this into account, especially the revised Preliminary Work Maps from FEMA that reduce the number of structures and size of the area included in the most hazardous category. With predictions of sea level rise and larger and more dangerous storms in the future, the mitigation efforts that the buyout programs represent will be far from sufficient to improve disaster resilience at a significant regional scale. However, with the principle of residential relocation away from hazardous areas, buyouts will hopefully prove to be a first step towards improved sustainability in the region.

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